

Development of State-Level Mathematics Curriculum Documents: Report of a Survey of ASSM^{1,2}

Introduction to the Report

The term "curriculum" is used in this report "to describe the set of learning expectations for students in grades K-12 in a subject such as mathematics. A central question that occupies state and local educators is, what mathematics should be the focus of instruction and student learning at particular grades/levels of the K-12 educational system?" (p. 2) The level of the system that should answer that question in the United States has moved, over time, from local districts to states. An accompanying move "toward more specificity in mathematics curriculum documents is driven, in part, by increased accountability in the form of state-mandated testing and, not coincidentally, by a call from teachers asking for more guidance in what mathematics to focus on at particular grades." (p. 3) Recent legislation has led to nationwide and international comparisons of student performances in mathematics.

This NSF-supported study reports the results of a 30-item online survey of state mathematics curriculum specialists in the Association of State Supervisors of Mathematics (ASSM). It was designed to describe the process of development of the newest mathematics curriculum documents. Survey responses were received from 47 of the 52 agencies contacted. [IA has no state-level curriculum documents; DC did not respond; IL, NH, and NY declined participation because they were in the process of revising their curriculum documents.]

The goals of the survey were to:

1. Describe current state mathematics curriculum documents and the processes used to develop them.
2. Describe conditions/resources influencing development of the most recent curriculum documents.
3. Identify major changes between the most recent and prior curriculum documents.
4. Gauge respondents' interest in assistance with future mathematics curriculum.

Findings and Discussion

Current state mathematics curriculum documents and the processes used to develop them

Many states have documents that specify grade-level learning expectations (GLE) for mathematics; some specify high school mathematics course learning expectations (CLE). The following table, based on data in Appendix A of the report, shows that about 35 of the 52 education agencies contacted (70 percent) had published K-8 mathematics GLEs since 2002, the year of passage of the No Child Left Behind Act.

Publication Year: Most Recent State-Level K-8 Grade-level Learning Expectations^a

Year	State(s)	No. of States
NA ^b	IA	1
1995	DE	1
1996	FL	1
1997	IL ^c	1
1998	AR, TX, WI	3
1999	MS, PA	2
2000	CO, IN, NE	3
2001	OH, SC	2
2002	DC ^d , NJ, NM, OK, OR, TN, VA	7
2003	AL, AZ, KS, LA, MN, MT, NC, NV, UT, WV, WY	11
2004	AK, CA, CT, DoDEA, GA, HI, KY, MA MD, ME, MI, MO, ND, NH ^c , RI, SD, VT, WA	18
2005	ID, NY ^c	2

^aData gathered in January 2005. ^bIA does not have a state-level curriculum document.

^cDidn't participate; in the process of revising its curriculum document. ^dDid not respond to the survey request.

The three most common reasons that the most recent mathematics curriculum document was developed were: to provide direction to teachers (81 percent); to guide state assessment development (70 percent); and to respond to NCLB legislation or other federal mandate (55 percent). Of 35 states publishing curriculum documents since 2002, 80 percent reported that the NCTM *Principles and Standards for School Mathematics* had a major influence on their development; 40 percent cited the NAEP Framework as a major influence.

Conditions/resources influencing development of the most recent curriculum documents

Thirty-four of the 47 states (73 percent) responding to the survey indicated that the documents were developed by a committee comprised of state people or of a mix of state and nonstate people. The mean size of a state committee was 35 members.

About four out of five respondents indicated that the most recent mathematics curriculum document "communicates to district personnel and teachers what will be assessed in the state mandated testing program in mathematics." (p. 11) Ninety-five percent of the respondents indicated that their GLE document will likely have a major influence on state assessments; 71 percent opined that the new curriculum document was "extremely well" aligned with their states' 2005-06 state assessments. Half indicated that the document "serves as the official mathematics curriculum document and all districts within the state must utilize it in formulating their own district mathematics curriculum." (p. 11) Many respondents felt that K-12 teachers, school administrators, and mathematics educators were favorably disposed toward the documents, but they were uncertain of the extent the understanding or opinion of other groups (e.g., parents, university mathematicians, business leaders).

Major changes between the most recent and prior curriculum documents

Asked about the document development process, one group of respondents indicated that the preparation of previous documents incorporated a wider representation of constituents and a generally longer timeline. But another group indicated that recent work involved a larger, broad-based writing group including teachers, administrators, community leaders, parents and university faculty. About one-third of respondents noted that the new document provided "increased specificity, particularly with regard to grade specific learning expectations." (p. 14) The new documents also featured a smaller number of content strands to organize the GLEs. About half of the respondents indicated that the new document would likely have a greater influence than the previous mathematics curriculum document, with most respondents attributing the increased influence to factors associated with NCLB. (p. 15)

Respondents' interest in assistance with future mathematics curriculum articulation

Eighty-five percent of respondents agreed to the need for national leadership in curriculum articulation. In particular, such leadership is needed "to increase the level of expertise and resources in developing a well-articulated mathematics curriculum and to promote higher, yet appropriate, curriculum standards." (p. 15) Among the curriculum articulation roles respondents described for professional organizations (e.g., NCTM, ASSM, NCSM, AMATYC, MAA, AMS) were contribution of broad-based expertise in mathematics content and pedagogy and K-12/higher education curriculum alignment. Among the specific needs mentioned was to make the case with politicians "to help them understand why teaching students using mathematical modeling, problem solving and application is critical to future learning." (p. 16)

About the Publisher

The Center for the Study of Mathematics Curriculum (CSMC) at the University of Missouri is funded by the National Science Foundation. It is a partnership that includes two other universities, Horizon Research, Inc., and public schools in Missouri and Michigan. The CSMC Major areas of work include understanding the influence and potential of mathematics curriculum materials, enabling teacher learning through curriculum material investigation and implementation, and building capacity for developing, implementing, and studying the impact of mathematics curriculum materials. The CSMC main office is located at 121 Townsend Hall, University of Missouri, Columbia, MO 65211. Website: <http://www.mathcurriculumcenter.org>

Caveat Emptor

This summary was prepared by Bob Kansky (robk@tribcsp.com). It's one of a series summaries offered to business, education, and policy leaders who are interested in the systemic improvement of mathematics and science education. The summary does not critique the report's assumptions, methods, or conclusions. It simply uses a somewhat standardized format to provide a brief introduction to the content of the report. Readers are encouraged to consult the original document for further information.³

¹Reys, B.J., Dingman, S., Sutter, A. Teuscher, D. (2005). *Development of state-level mathematics curriculum documents: Report of a survey*. Columbia, MO: Center for the Study of Mathematics Curriculum, University of Missouri. 19 pages.

²Association of State Supervisors of Mathematics (ASSM).

³The full report is available for downloading (PDF) at <http://www.mathcurriculumcenter.org/resources/ASSMReport.pdf> .